west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone 304/926-0475 • FAX: 304/926-0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET
BACKGROUND INFORMATION

Application No.:	R13-3251
Plant ID No.:	107-00153
Applicant:	Hino Motors Manufacturing U.S.A., Inc. (HINO)
Facility Name:	Williamstown, West Virginia Plant
Location:	Williamstown, Wood County, WV
NAICS Code:	371101
Application Type:	Construction
Received Date:	May 26, 2015
Engineer Assigned:	William T. Rothwell II, P.E.
Fee Amount:	$2000.00
Date Received:	June 1, 2015
Completeness Date:	June 23, 2015
Due Date:	September 1, 2015
Newspaper:	*The Parkersburg News and Sentinel*
Applicant Ad Date:	June 1, 2015
UTMs:	Easting: 459.52 km Northing: 4,360.60 km Zone: 17
Description:	Permit for the construction of a truck assembly and painting facility.

DESCRIPTION OF PROCESS

HINO installed a medium duty truck assembly plant in an existing building near Williamstown, West Virginia in 2007. The facility was approved for installation under a permit determination and therefore does not have an existing Rule 13 permit. The standard color of the HINO trucks is white. The white truck cabs, fenders, and hoods are delivered finished from other Hino operations or suppliers. Currently, other colors are painted off-site. HINO is now proposing to install a custom color operation which will allow custom colors application at the assembly facility.

The following are the identified emission sources (proposed and existing) at the facility:

Custom Color Operation
Equipment – Paint Booths with Heaters (1S-3S) and Body Prep Area (4S)

The proposed custom color operation will initially include two paint booths with heaters and a body prep area. A third paint booth is proposed for future operations. The white paint will be prepped in the body prep area to allow the custom color to adhere to the existing paint. This operation will be a scuffing type operation to remove the glossy finish of the existing paint. The body of the truck will then be moved into the paint booths and the custom color (primer, paint, and clearcoat) will be applied. Although the initial operation will include mostly custom color application and not a complete body painting, the permit will allow for a quantity of primer, paint, and clearcoat (approximately one gallon of each per vehicle) to allow for approximately 5,000 truck cabs to be painted, whether it is a complete paint job or custom color application.

The painting sequence will be intermittent with the application of a coating, then a 15 minute tack time prior to the next coating operation. After the clear coat has been applied, the paint booths will be closed and the temperature will be raised to accelerate drying. For the emissions estimate, it is assumed that the entire process can occur in one hour. The actual time may be longer due to the need to apply at least two color layers and two clearcoat layers with the 15 minute tack time between applications of each layer. The drying time is anticipated to last approximately 30 minutes. This group also includes paint mixing.

Miscellaneous Touch-Up, Cleaning, and Material Use (5S)
Equipment – Various uses of aerosol and other paints to touch up scratches during inspections, cleaners for the painting operations, and materials which contain VOCs and HAPs that are used on the assembly floor

HINO receives parts from numerous suppliers which are shipped in wrapped and stored at the site. The main two colors that are used for touch up are black and white (since this is the current major color scheme). The frame and other major parts under the body are painted black. The current main color for the body is white. The facility uses Rustoleum products for touch up at the inspection stations. These paints are only anticipated to release VOC from the facility. Additionally, at the beginning of the assembly line there is a pot sprayer with Asian paint. This paint is VOC free. Other products are used, such as a rubberized undercoating, Magnaflux Spotcheck, WD-40, brakleen, and cleaners for the painting operation. The VOC and HAP constituents of these materials are anticipated to be released from the building.

Welding (6S)
Equipment – Welders

Welding occurs when the facility shortens a wheel base for the trucks. The frames are cut with a saw and then the ends need to be refinished to replace the endcaps on the frames. Welding emissions are based on the worst case emissions estimate from each type of welding electrode in AP-42, Section 12.19-2.

Truck Engine Emissions (7S)
Equipment – Assembled Vehicles on the Inspection Line

After assembly is completed on a vehicle they are inspected. The inspection has several steps where the engine is on or off depending on what is being inspected. The emissions from the engines are based on certified manufactures emissions, AP-42, and an approximate run time of 40 minutes per engine. Once the trucks leave the building, they are mobile equipment and the engine emission are not counted toward the potential to emit.

Parts Washers (8S)
Equipment – Parts Washer (2)

Two parts washers are located at the site. There is one in the maintenance area and one in the inspection area. The emissions from the parts washers are based on AP-42. Fluids are only refreshed as needed.

Emergency Generator (9S)
Equipment – Generac QuietSource 22 KW

There is an emergency generator to power the emergency lights and office operations should a power failure occur. The generator is not sized to power the facility during power disruptions. The emergency generator is a natural gas fueled 40 horsepower engine and is certified under 40CFR60, Subpart JJJJ. Emissions are based on manufacturer's emissions and AP-42.

Building Heaters (10S)
Equipment – Multiple Trane, Lennox, Reznor, and Horizon natural Gas Fueled Heaters

There are 33 building heaters at this site. The building had heaters when HINO moved into the site. There are 29 existing heaters with heat ratings ranging from 120,000 Btu/hr up to

800,000 Btu/hr. The new addition, which will heat the color custom department, will include the addition of 4 new building heaters. The emission from the heaters are based on the total heat ratin of the heaters and AP-42 emission factors. The 29 existing heaters have a total heat rating of 16.21 MM Btu/hr. The new heaters have a total heat rating of 2.2 MM Btu/hr.

Vehicle Activity (VA)
Equipment – Assembled vehicles moving on paved and gravel surfaces and delivery vehicles on paved surfaces

Future estimates call for assembly of approximately 20,000 trucks. The trucks leave the assembly building and drive around the building to the gravel parking area. The trucks are then sold and driven off the gravel area for delivery to the customer.

Additionally, this facility receives parts to assemble the trucks in shipping containers and other delivery trucks. These vehicles drive to either the unloading docks or to the container storage area at the back of the property. Delivery vehicles are on paved road surfaces while at the site. AP-42 emissions estimate methods are used to determine the emissions.

SITE INSPECTION

A site inspection was deemed unnecessary at this time.

From I-77, take exit #185 to Williamstown (State Route 51) and go 0.2 miles. Turn left on Highland Avenue (State Route 14) and go 1.4 miles. Turn left on State Route 14 and travel 1.5 miles. The facility is located on the left.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions generated at this facility are mainly from applying surface coatings, the body prep room, and associated touchups and cleaning activities. The pollutants emitted are particulate matter and VOCs, which include hazardous air pollutants (HAPs).

The white paint will be prepped in the body prep area to allow the custom color to adhere to the existing paint. This operation will be a scuffing type operation (sanding) to remove the glossy finish of the existing paint to allow for painting.

VOC estimates from the three identical paint booths (1S), (2S), & (3S) at this facility were determined by using a mass balance approach and assuming that all of the VOCs in the coating were emitted. To estimate the hourly emissions the Regulation 21, Section 19,

limitations are being utilized. The paint and primer meet the definition of air-dried coatings with VOC limits of 3.5 pounds per gallon. The clear coat has a VOC limit of 4.3 pounds per gallon. Therefore, for the maximum hourly VOC emissions it was assumed that the operation will use clear coat for one hour. The maximum hourly particulate emissions (PM, PM_{10}, and PM2.5 assumed to be equal) were based on the highest solids coating being utilized for the entire hour. Maximum HAP emissions were based on the percent by weights of the HAPs present in the materials, the gallons per hour capacity of the paint gun, and the unit weight of the specific material. It was assumed that the material is used for an entire hour and the highest HAP value was taken as the emission value.

Table #1	PM Emissions from Coatings				
Application System	Coating	Hourly Coating Usage (Gal)	Transfer Efficiency (%)	Solids Content lb/gal	PM, PM_{10}, & $PM_{2.5}$ Emission Rate lb/hr
HVLP	Color Atlas White (CAS992)	11.16	65	7.59	0.30

Assuming each of the three paint booths are consuming 3.72 gallons of the respective highest solid content coatings at 7.59 ppg; the facility would have an hourly PM rate of 0.10 pounds per hour for each paint booth. HINO has proposed annual limit of 15,000 gallons of total coatings used at the facility. This usage limit would restrict the facility's worst-case potential of PM, PM_{10}, & $PM_{2.5}$ to just 0.20 tons per year for each paint booth.

Emissions from the three natural gas fired paint booth heaters (1S), (2S), & (3S) were combined with the paint booths and included in the permit. The three heaters have a combined maximum heat input of less than 5 MMBtu/hr.

The PM, PM_{10}, & $PM_{2.5}$ emissions associated with the Body Prep Room (4S) were calculated using 5,000 lbs/hr as the maximum weight of processed material processed through the operations in a single hour and Rule 7, Table 45-7A dictated an emission rate for a type 'a' source to be 5.0 lbs per hour for PM. Thus, the applicant requested the permit limit for PM, PM_{10}, & $PM_{2.5}$ to be 5.0lbs/hr, 2.38 lbs/hr, and 2.38 lbs/hr respectively.

In the application, the only significant emissions from the welding process (6S) were PM and manganese emissions, of which, manganese is hazardous air pollutant.

HINO used the worst case emission factor of all electrode types from AP-42, Table 12.19-1. The highest PM emission factor (81.6 per 1,000 pounds) was multiplied by the

maximum amount of electrodes consumed in a year (500 pounds per year) to predict an annual PM, PM10, & PM2.5 rate of 0.02 tons per year.

There are 33 natural gas fired building heaters associated with the facility (29 existing and 4 new). The emissions from the heaters were based on the total heat rating of the heaters (16.21 MM Btu/hr and 2.2 MM Btu/hr) and AP-42 emissions factors.

The truck engine emissions associated with this facility were deemed insignificant and not included in the permit.

The following table is summary of the emissions from the HINO's Williamstown Facility;

Table # 2				
Criteria Pollutant	Total Emissions			
	Uncontrolled		Controlled	
	lb/hr	ton/yr	lb/hr	ton/yr
VOC	53.80	37.14	53.78	37.05
PM	50.90	65.27	21.52	45.54
PM_{10}	36.32	36.88	6.94	17.15
$PM_{2.5}$	32.90	32.00	3.52	12.27
NO_X	2.98	11.46	2.98	11.46
CO	10.84	10.64	10.84	10.64
SO_2	2.54	7.43	2.54	7.43
Total HAPs	13.39	5.17	13.39	5.17
Lead	0.000011	0.000049	0.000011	0.000049

REGULATORY APPLICABILITY

45CSR4 To Prevent and Control the Discharge of Air Pollutants Into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors

The facility is subject to the requirements of 45CSR4 and shall not allow the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.

45CSR7 To Prevent and Control Particulate Matter Air Pollution From Manufacturing Processes and Associated Operations

The facility will not cause, suffer, allow or permit particulate matter to be vented into the open air form any type source operation or duplicate source operation, or from all pollution control equipment installed on any type source operation or duplicate source operation in excess of the quantity specified under the appropriate source operation type in Table 45-7A of the rule.

The purpose of this rule is to prevent and control particulate matter air pollution from manufacturing process and associated operations.

The facility performs sanding (grinding) of the existing paint on the truck body to allow for the new paint to adhere to the rough surface. The Regulation 7 particulate mass standard limit was used to estimate the emissions. Using 5,000 pounds per hour as the maximum weight of process material processed through the operations in a single hour, for an 'a' source Table 45-7A results in a particulate matter emission rate of 5.0 lbs/hour.

The process activities involved with the coating process is classified as type "a" source operation. Using the maximum hourly application rate of 28.26 pounds per hour listed in the application on page N2 of N19, along with a transfer efficiency rate of solids at 65%, and a control efficiency of 99% for the fabric filter control device, it was determined that each paint booth's maximum controlled PM to be 0.10 pounds per hour. Thus, this operation should have no problem achieving compliance with the process weight limits of this rule.

45CSR13 - Permits for Construction, Modification, Relocation and Operation of Stationary sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The purpose of this rule is to set forth the procedures for stationary source reporting, and the criteria for obtaining a permit to construct and operate a new stationary source which is not a major stationary source, to modify a non-major stationary source, to make modifications which are not major modifications to an existing major stationary source and to relocate non-major stationary sources within the State of West Virginia.

Hino Motors Manufacturing U.S.A., Inc. has proposed to install paint booths that have a potential to emit before controls greater than 6 pounds per hour and 10 tons per year of particulate matter and volatile organic compounds. Thus, Hino Motors Manufacturing U.S.A., Inc. must obtain a permit for the paint booths as required in 45CSR§13-5.1. The company has complied with the public review procedures in 45CSR§13-8.3. by publishing a legal ad in The

Parkersburg News and Sentinel on June 1, 2015. In addition, the applicant submitted a complete application and paid the permit application fees.

The source has potential to emit of less than 100 tons per year of VOCs. In addition, emissions of HAPs are below the major source trigger levels of 10 tons per year of single HAPs and 25 tons per years of total combine HAPs. Thus, the source is not subject to a MACT standard as a major source or required to obtain a Title V operating permit in accordance with 45 CSR 30. Therefore, the source is subject to 45 CSR 22 as a 9E – Miscellaneous Surface Coating.

45CSR21 Regulation To Prevent And Control Air Pollution From The Emission Of Volatile Organic Compounds

This rule is West Virginia's application of RACT for stationary sources located in Cabell, Kanawha, Putnam, Wayne, and Wood Counties. HINO's Williamstown Plant is subject to one section of this rule, which is Section 19.

The paints and primer utilized at the plant meets the definition of air dried coatings. Therefore, the coatings applied at the facility will be subject to VOC content limitation of 3.5 pounds of VOC per gallon of coating as applied as extreme performance coating or as air-dried coating under this section. The paint and primer at HINO as applied meets the 3.5 lbs/gallon paint VOC limit and the clear coat meets the 4.3 lbs/gallon VOC limit.
The following table contains a list of coatings and cleaners utilized at the facility.

Table # 3	
Product Code	**Product Name**
CAS981	Color Atlas White
CAS993	Color Atlas Black
CAS1037	Color Atlas Red
CAS992	Color Atlas White
CAS200	Color Atlas Yellow
CAS250	Color Atlas Yellow
CAS364	Color Atlas Green
CAS367	Color Atlas Green
CAS523EW	Color Atlas Blue
CAS525EW	Color Atlas Blue
CAS667EW	Color Atlas Blue
CAS505EW	Color Atlas Neutral

CAE76 SDS	Color Atlas Blue
CAE153EW	Yellow
CAE254EW	Green
CAS413EW	Color Atlas Blue
15305S™	Medium Temperature Activator
189S™	Accelerator
89S	Pot Life Extender
8430S	Imron Elite Appearance Clearcoat
15305S™	Medium Temperature Activator
389S™	Accelerator
825P32760	Gray Hybrid Epoxy Primer
FGP32765	Hybrid Primer Medium Activator
1220S	Gray Urethane Sandable Primer
194S™	Low Haps Activator
3901S	Final Klean Fast-Dry Cleaner
3909S	Low VOC Final Klean
106™	Lacquer Thinner
108™	Low HAPS Cleaning Solvent

40CFR60 Subpart JJJJ — Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

This subpart applies to engines and requires testing to verify of meeting emissions levels or certification. The EPA Certified 22 kW Generac Model QT022, Model Year 2014 Emergency Generator, will not exceed 500 hours per year of operation. The 40 hp engine's emissions shall not exceed 0.19 lb/hr and 0.05 TPY of NOx and 8.93 lb/hr and 2.23 TPY of CO.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Ethyl benzene

Ethyl benzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethyl benzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethyl benzene by inhalation in humans has shown conflicting results regarding

its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethyl benzene. Limited information is available on the carcinogenic effects of ethyl benzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethyl benzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethyl benzene as a Group D, not classifiable as to human carcinogenicity.

Toluene

Toluene is a clear, colorless liquid with a distinctive smell. Toluene occurs naturally in crude oil and in the tolu tree. It is also produced in the process of making gasoline and other fuels from crude oil and making coke from coal. Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives, and rubber and in some printing and leather tanning processes.

Toluene may affect the nervous system. Low to moderate levles can cause tiredness, confusion, weakness, drunkentype actions, memory loss, nausea, loss of appetite, and hearing and color vision loss. These symptoms usually disappear when exposure is stopped. Inhaling High levels of toluene in a short time can make you feel light-headed, dizzy, or sleepy. It can also cause unconsciousness, and even death. High levels of toluene may affect your kidneys.

Studies in humans and animals generally indicate that toluene does not cause cancer. The EPA has determined that the carcinogenicity of toluene can not be classified.

Xylene

Commercial or mixed xylene usually contains about 40-65% *m*-xylene and up to 20% each of *o*-xylene and *p*-xylene and ethyl benzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

Styrene

Styrene is a colorless liquid that evaporates easily and has a sweet smell. It often contains other chemicals that give it a sharp, unpleasant smell. Styrene is widely used to make plastics and rubber. Products containing styrene include insulation, fiberglass, plastic pipes, automobile parts, shoes, drinking cups and other food containers, and carpet backing. Most of these

products contain styrene linked together in a long chain (polystyrene) as well as unlinked styrene. Low levels of styrene also occur naturally in a variety of foods such as fruits, vegetables, nuts, beverages, and meats. In addition, small amounts of styrene can be transferred to food from styrene-based packaging material.

If you breathe high levels of styrene (more than 1000 times higher than levels normally found in the environment), you may experience nervous system effects such as changes in color vision, tiredness, feeling drunk, slowed reaction time, concentration problems, or balance problems. Hearing loss has been observed in animals exposed to very high concentrations of styrene. Changes in the lining of the nose and damage to the liver has also been observed in animals exposed to high concentrations of styrene, but animals may be more sensitive than humans to these effects.

The International Agency for Research on Cancer (IARC) has determined that styrene is a possible human carcinogen.

AIR QUALITY IMPACTS ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not required, because the proposed construction does not meet the definition of a major source as defined in 45CSR14.

MONITORING OF OPERATIONS

Per Section 4.1.4.a., the identity of any new coating containing a HAP(s) not listed in permit application R13-3251 must be identified to the Director in writing within thirty (30) days of using the coating. An MSDS sheet for the coating must also be supplied.

- Per Section 4.1.4., a 12-month rolling total must be used to determine that an individual HAP does not exceed 10 ton/yr.

- To determine if the VOC and PM limits given in Section 4.1.1. and 4.1.2. are met, the permittee will need to monitor and record:

  - name and id number of each coating applied.
  - number of hours used to apply each coating.
  - date applied and amount of each coating applied, and

• amount of each coating disposed of a waste.

Using the above information, an annual combined VOC emission rate is to be calculated based on paint and solvent usage using a rolling total for any continuous span of 12 months.

- To determine if the PM limits in Section 4.1.2. are met, the permittee is to maintain records showing that the dry filters were changed out.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application R13-3251 indicates that Hino Motors Manufacturing U.S.A., Inc. should meet all the requirements of the applicable rules when operated according to the permit application. Therefore, the writer recommends granting the applicant a Rule 13 construction permit for their truck assembly and painting facility.

William T. Rothwell II, P.E.
Engineer

Date: July 27, 2015